

## WINDS.

The prevailing winds at the Signal Service Stations are shown by arrows on chart No. II, by an examination of which it will be seen that they have been very generally north or westerly. In southern Texas, Minnesota, Montana, Nevada, Idaho, Oregon and Washington Territory they have been southeasterly.

*Total Movements of the Air.*—The following are the *largest* monthly movements recorded at the Signal Service Stations, viz: Sandy Hook, 13,949 miles; Cape May, 13,509; Pikes Peak, 12,439; Cape Lookout, 12,134; Thatcher's Island, 11,954; Kittyhawk, 11,004; Portsmouth, N. C., 10,165; Indianola, 9,809; Sandusky, 9,704; Barnegat, 9,659; New York, 9,049; Wood's Holl, 8,982; Newport, 8,724; Boston, 8,619. The *smallest* are: Visalia, Cal., 1,491 miles; Deakwood, Dak., 1,754; Nashville, 1,913; Virginia City, 2,178; Shreveport, 2,235; Lynchburg, 2,583; Uvalde, Tex., 2,630; Knoxville, 2,674; Indianapolis, 2,869; Dubuque, 2,876; Boise City, Idaho, 3,041; Augusta, Ga., 3,122; Sacramento, Cal., 3,140; Salt Lake City, 3,148; Los Angeles, Cal., 3,293.

## VERIFICATIONS.

*Indications.*—The detailed comparison of the tri-daily weather Indications, with the telegraphic reports for the succeeding twenty-four hours, show the general percentage of omissions to be 0.5 per cent., and of verifications to be 90.7 per cent. The percentage of verifications for the four elements have been: weather, 95.1; wind, 88.1; temperature, 91.7; barometer, 87.8. The percentage of verifications by geographical districts have been: New England, 89.1; Middle States, 90.8; South Atlantic States, 91.3; East Gulf States, 88.2; West Gulf States, 90.4; Lower Lake region, 91.0; Upper Lake region, 89.7; Tennessee and Ohio valley, 92.4; Upper Mississippi valley, 92.4; Lower Missouri valley, 91.5. Of the 3,588 predictions that have been made, 82, or 2.3 per cent., are considered to have entirely failed; 90, or 2.5 per cent., were one-fourth verified; 326, or 9.1 per cent., were one-half verified; 85, or 2.4 per cent., were three-fourths verified; 2,999, or 83.8 per cent., were fully verified, so far as can be judged from the tri-daily weather maps.

*Cautionary Signals.*—During the month 260 Cautionary Signals were displayed; 202 or 77.7 per cent., were justified by subsequent hourly velocities of 25 miles or over at or within 100 miles of the station.

*Cautionary Off-shore Signals.*—twenty-nine signals, not included in the above, were ordered up as Cautionary Off-shore Signals; 26 or 89.7 per cent. of these were justified, both as to velocity and direction. seventy-six Cautionary Signals were changed to Cautionary Off-shore Signals, and as to direction were all justified; as to velocity they are considered with the Cautionary. Thirty nine cases were reported, generally from scattered stations, of winds of 25 miles or over, when signals were not ordered.

## NAVIGATION.

In the table on the right hand of chart No. III are given the highest and lowest readings on the Signal Service river gauges, during the month, with dates of same, from which it will be seen that the Mississippi and its western tributaries have continued low throughout the month. In consequence of the heavy rains during latter portion of month, (mostly due to storm-areas Nos. X and XII) rapid rises occurred in the head waters of the Ohio and tributaries, and in the Savannah river. *Ice in rivers.*—*Missouri*—Lower Brule Agency, Dak., 8th, last boat of season passed down. 30th, river covered with floating ice. Plattsmouth, 26th to 30th, soft ice floating in river. *Mississippi*—La Crosse, 29th and 30th, ice running from Black river in small pieces.

*High Tides.*—Tybee Island, Ga., 19th; Flushing, N. Y., 22nd, (3½ feet above ordinary high tide-mark;) on the 23rd, Eastport, Me., running over some of the wharves; Portland, Me., highest known for years, even with the wharves.

*Low Tides.*—Indianola, Tex., 22nd to 30th; Tybee Island, Ga., 22nd and 23rd, long continued off-shore winds have caused very low water in the Savannah river, affecting navigation somewhat, and causing the lowest tide known for many years.

## ATMOSPHERIC ELECTRICITY.

*Thunder-storms.*—3d, Tex. 4th, N. M. 5th, N. M., Wis., Mich. 6th, Iowa, Ill., Kan., Mo. 7th, N. M., Tenn., Ill., Ind., Ky., Tex. 9th, Ind. Ty. 10th, Tex. 11th, N. C. Ill., Ky., Tex. 12th, N. C., Va. 14th, Ill., Tex. 15th, Ala., Tex., Miss. 16th, Tex. 17th, Tex. 18th, Ala., Miss. 19th, Fla., N. C. 20th, La., Va. 21st, N. C., Va. 22d, N. J., Va. 23d, Mass., Minn. 24th, Tex. 25th, La., Tex. 26th, Fla.

*Auroras.*—Pembina, Dak., 18th; Dubuque, Ia., 16th; Escanaba, Mich., 30th; Boston, 30th; Cresco and Nova Springs, Ia., 30th; Cornish and Mechanics Falls, Me., 14th; Gardiner, Me., 6th, 20th, 30th; Waltham, Mass., 14th. 30th; Cambridge, Mass., 14th; St. Anthony, Minn., 29th; Oregon, Mo., 14th; Contoocookville, N. H., 14th; Starkey, N. Y., 7th; Cape Vincent, N. Y., 14th; Franklin, Pa., 12th; Woodstock, Vt., 40th; Beloit, Wis., 21st.

*Telegraphic Communication Interfered with by Atmospheric Electricity.*—Santa Fe, N. M., 7th, 8th, 9th; Albuquerque, N. M., 13th; Ft. Sill, Ind., Ty., 9th, line ceased working.

## OPTICAL PHENOMENA.

*Solar Halos.*—1st, Conn., Cal.; 2d, Cal.; 4th, Fla., Tex.; 5th, Ia., Mo., O., La., Miss.; 7th, Tex., Fla., Conn., Tex.; 8th, Dak., Mass., Tex.; 9th, Dak., Conn., Mi-s., O., La.; 10th, O., Ind.; 11th, Dak., Conn., Ill., Miss.; 12th, N. M., Conn., Cal.; 13th, N. J., Tex.; 14th, Iowa, Mo., O., Ill., Ind., Me., N. J.; 15th, Ia., O., R. I., Conn., Ill., Mass., Mich., N. H., N. J., N. Y., V.; 16th, Conn., N. Y. 17th, Wis. 18th, Ia., Minn.,